Learning Technologies Project Bulletin

Brought to you by NASA, TRW, & West Virginia University

Nothin' but Net

The Essence of Effective Scanning

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Scanners allow us to capture almost any image and create a digital version of that image that a computer can understand. Scanned images can be anything from artwork and photos to text—even small 3-D objects like flowers or fabric. An office picture can be scanned and printed in the company bulletin, or artwork can be incorporated into a design. The possibilities are endless.

Along with understanding the basics of the hardware and software, however, knowing the variety of ways in which to scan in and use images can save time and effort and

produce better results. Most scanning software offers several choices when it comes to the type of image to be scanned. These

OFFICE DESK ORNAMENT (3 D)
SCANNED IN AS
BLACK AND WHITE DRAWING
150 DPI.

can be broken into several categories, which will be defined here as line art, halftones (gray scale and color), gray scale, and color.

Line art scans have no shading and are only black. They usually consist of pen-and-ink drawings, some pencil drawings, and clipart. This is considered one-bit scanning, which means that the computer sees only black or white. Line art should be scanned at a high resolution because low-resolution scans will produce jagged edges.

Halftone scanning is used most with pre-printed images and photographs. If the goal is a high-quality scan, use this setting last.

Grayscale scanning is used mainly with original photographs. It can produce up to 256 shades of gray. A color scan can range from 24-bit to 36-bit and allow up to 16 million colors. Some scanning software offers choices for different types of line art, halftones, gray scaling, black-and-white, and color photographs.

A scanned image can only be as good as the original. Always choose the cleanest and best-exposed image to scan and always consider the scanned resolution setting compared with the output resolution setting.

News Bytes

Stennis Space Center Hires Teachers to Search, Evaluate Remote Sensing Sites

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NASA's John C. Stennis Space Center's Educator Resource Center, through the Learning Technologies Project, has employed six teachers to aid in the development of a

basic remote sensing Web site. The project began on July 13.

Remote sensing of the Earth is the ability to collect information about our planet's surface with sensors mounted on aircraft and satellites. The information gathered by these sensors can be used to make accurate maps of the Earth's surface. The teachers will search for and evaluate existing remote sensing Web sites. They will be looking for best practices to include in "From a Distance," the Stennis Space Center's remote sensing Web site that is now in development. Each teacher will also develop ten lesson plans that will be used in conjunction with the Stennis remote sensing Web site.

In addition to assisting with development of this Web site, the teachers will provide feedback to the Smithsonian Institution on plans for four proposed electronic field trips that will show how scientists are using remote sensing in the work force.

Twenty-two teachers were nominated to participate in this project. The six who were chosen are Andy Allred, Farmerville (La.) School District; Claudia Freeman, Gulfport (Miss.) School District; Cheryl Gerard, St. Tammany Parish (La.) School District; John Massengale, Poplarville (Miss.) School District; Kathy Roberts, Long Beach (Miss.) School District; and Ann Vanderbeek, LaGrange (Ga.) School District.

In the Spotlight

LDAPS Announces Relationship with National Instruments, LEGO DACTA, Tufts

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A relationship between National Instruments (makers of LabVIEW software, upon which ROBOLAB and LEGO Engineer are based), LEGO DACTA, and Tufts University was announced recently. See the press release at **http://www.natinst.com/robolab/**.

This relationship grew directly out of the LDAPS project, and as a result a programmable LEGO brick using software developed at Tufts University will be marketed in the fall. This product will be available to teachers in the US and around the world.

LDAPS members Martha Cyr and Ben Erwin were well received at the American Society of Engineering Education's national conference in Seattle, Washington. The LDAPS curriculum was included in a book of K-12 engineering ideas published by the Women in Engineering division of ASEE.

Fifteen K-8 teachers from the St. Agnes School in Arlington, Massachusetts, recently participated in a two-week LEGO engineering workshop. The teachers were able to work on LEGO design and building activities, including a ramp car (gravity), a balloon-powered car (pressure), a fishing rod (gearing up and gearing down), and a sailcar (wind energy).

Participants programmed a motorized LEGO car using LEGO Engineer software as part of the curriculum theme "Making Things Go." They also took apart diet scales to see how they worked, then made their own scales out of LEGO pieces as a part of the curriculum theme "The Way Things Work." In addition, teachers worked as an engineering design company on a large systems engineering design project—making a LEGO-powered mini-golf course in the Center for Engineering Educational Outreach. The golf course involved systemic/managerial, programmatic, and structural elements and required lots of cooperative learning. See all three projects at **http://ldaps.ivv.nasa.gov/Curriculum/legoengineering.html**.

Teachers learned about feedback by designing and programming a LEGO device that indicated hot and cold using a LEGO temperature sensor and LEGO outputs, such as motors and lights. They were responsible for creating a LEGO curriculum for their classrooms so that they will have something to start with when they return to class in the fall. Presentations of the curricula and of the systems engineering project can be found on the Web at **http://ldaps.ivv.nasa.gov/Workshop/StAgnes/index.html**.

In the near future, LDAPS members will be traveling to Pleasanton, California, to run a two-week teacher workshop with the support of Christiy Budenbender of NASA's Ames Research Center. This will be the first workshop to use the RCX (the programmable LEGO brick) and ROBOLAB (the software used to program it). A preview of this workshop is at **http://ldaps.ivv.nasa.gov/Workshop/VintageHills/index.html**.

LDAPS members will be traveling to NI WEEK (National Instruments Week) August 24-27 to give several talks and demonstrations of ROBOLAB, the LabVIEW-based graphical programming environment for kids to use to program the RCX.

In an effort to begin to mirror the successful teacher workshops at the NASA centers around the country, NASA's Langley Research Center will begin incorporating the ideas and methods of LDAPS into some workshops in August and September.

Highlights & Happenings

ALLSTAR Finishes Banner Year

Drs. Cesar Levy and M. A. Ebadian
http://www.allstar.fiu.edu

Material development during the month of June included finishing Level 3 (for high school/junior college students). Changes were made and typographical errors on the Web site were corrected, mainly based on visitors' comments. The Miami-Dade Community College team finished its flight performance and flight instruments portion of the Web site and demonstrated their additions to Level 3 of the ALLSTAR project at the meeting.

Prime Technologies, ALLSTAR's small-business partner, began production of the ALLSTAR Careers Exploration Pre-Release Version 1.5 CD-ROM (SCALEUP application). In addition, the Prime Technologies team completed kiosk usage statistics reports for 12 schools based on analysis of the data obtained from the ALLSTAR kiosks. Prime Technologies has also given demonstrations of the ALLSTAR Learning Lab Web site (including the Discussion Forum and Blacks in Aviation) to PRIME, Inc. (a company not related to Prime Technologies). This is a Philadelphia-based nonprofit organization which runs science and technology programs in 90 schools throughout the city of Philadelphia. Based on ongoing discussions, PRIME, Inc. plans to distribute pre-trial versions of the CD-ROM to selected schools in Philadelphia.

In reviewing the third year of the grant and accomplishments since the beginning of the grant, here is a summary of ALLSTAR accomplishments to date:

· Over 700 Web pages on the site (more are being uploaded weekly)
· Level 1, 2, and 3 materials are up and running
· Three galleries of pictures and one video gallery
· A Teacher Resource Guide tied to National Science Standards and Florida Sunshine State Standards
· Over 100 biographies of aviators, engineers, and pioneers in the area of aeronautics
· Highlights of 11 research topics taking place in NASA centers across the nation

News Bytes (cont.)

Children's Interactive Expo Set for Fall in San Francisco

Shannon Tobin
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Organizers of the Children's Interactive Expo would like to invite NASA's Learning Technologies Project and its individual affiliates to participate in this annual technology event.

Q: When and where is the Children's Interactive Expo (CIE)?
A: The CIE takes place October 8-11, 1998, at Fort Mason in San Francisco.

Q: What is the CIE?
A: It is an "Invitation Only" technology expo focusing on the highest-quality educational products. Once a year, the CIE brings together all those responsible for the education of our youth, including educators, curriculum experts, students, parents, buyers, the media, industry leaders, and government officials.

Q: Not another trade show! What makes this one so different?
A: Just as the Sundance Film Festival is a trade event for high-quality films, the CIE is a trade event for top-quality technology products. The CIE has been created to empower people to embrace technology by giving them knowledge through hands-on use and effective training—to help parents, teachers, students, children, buyers, and government officials make informed decisions about what really works. The CIE has been created to involve the users with the makers in order to develop higher-quality products and tools for the classroom and the home. The goal of the CIE is to support only top-quality products from around the world.

Q: Why do you do this? Is CIE a non-profit organization?
A: We believe that a happy nation is a thinking nation when empowered by the ability to make choices. No, we are not a non-profit organization, although we provide free training, donate software to schools, libraries, and community centers, and much more.

Q: What is place2b.com?
A: It is a Web site which supports high-quality technology for pre-K through college. Its features include an online database for product searches, training, funding and resources, CIE event information and registration forms, lesson plans, classroom projects, home activities, and more.

Q: When should teachers attend?
A: The first two days, October 8 and 9, are education and trade days (closed to the general public). Admission and training services for all educators and students are free.

Q: Can I bring my students?
A: Unlike any other "trade show," the Children's Interactive Expo encourages students to attend. We believe students are essential to integrating and developing the role of technology in the classroom. Field trips and teacher/student workshops can be scheduled from 9:30 a.m.-12:30 p.m. Teachers can request the type of training they need and the CIE will provide it...free! Teachers can register on the Web site at **http://www.place2b.com**, call 415/495-3000, or send e-mail to expo@place2b.com.

Q: I am a teacher and want to attend technology training without my students. When should I come?
A: After 1:00 p.m., when the students return to their schools, the show is for adults only. Every hour on the hour from 1:00 p.m.-5:00 p.m., CIE offers hands-on curriculum training sessions for teachers. Prin-

Highlights & Happenings (cont.)

are provided on the Web site; a forum for private, innovative research is provided

·A discussion forum answered by mentors through the Prime Technologies Web site at **http://www.prime-tech.com/allstar/** which can be accessed through **http://www.allstar.fiu.edu/aero/prime-DF.htm**

·Established the Blacks in Aviation section to address contributions to aeronautics development

·Added one kiosk to original grant proposal; all 13 kiosks in public schools around Miami-Dade County are up and running

·Provided workshop for local teachers and two workshops at NSTA convention

·Made presentations to schools and educators (FIU team and Prime Technologies)

·Attended several national conferences related to science, engineering, and aeronautics (FIU team and Prime Technologies)

·Attended Internet-related conventions and conferences to bring new ideas and technological innovations to the project

·Received eight awards and site recognition from local and national organizations, such as Study Web, Discovery Channel, 4kids.org, PBS, Nova Online, National Academy Press, Exploratorium of San Francisco, and *The Miami Herald*

·Completed user survey (will be explored in more detail in the next fiscal year)

·Over 2.9 million hits since June 1997

·Transferring over 30.8 GB of material since June 1997

·Over 131,000 unique IP addresses since June 1997

·More than 94% of users are coming back to the site every month

Special thanks go to Dr. Massenberg, Director of the Office of Education at LaRC, who has been very supportive of this effort; Mark Leon and Christiy Budenbender of NASA Ames; and the other CAN PIs for their input and comments. Finally, a special thanks to NASA for believing in this project enough to fund it.

News Bytes (cont.)

cipals of all types of schools may schedule free professional staff development days at the CIE. The CIE will tailor the sessions according to that particular school's training needs. Teachers can receive one CEU (Continuing Education Unit) for each class they attend.

Q: Who organizes the training sessions?
A: The sessions are organized by CIE management in conjunction with ISTE, Skillbank, and selected premier training resources.

Q: How many people came to the show last year?
A: Approximately 24,000.

Q: I produce an educational technology product. How do I get invited?
A: All products must be reviewed by the CIE Reviews Committee to determine whether they meet CIE's criteria. Products must be engaging, educationally sound, supportive, and non-violent. Only the highest-quality products are included.

Q: How many technology companies are invited and what types of technology will be at the CIE?
A: There will be 180 companies, including producers of software, CD-ROMs, digital cameras, toys, tools, specialty keyboards, speech-to-text software, Internet browsers, and e-mail programs.

Q: How do I find out more?
A: Call 415/495-3000, or visit the Web site at **http://www.place2b.com.** Send mail to Wassadamo LLC, 915 Cole Street, Suite 118, San Francisco, CA 94117.

Two New Informational Sites Online

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Two new informational sites that will benefit individuals involved with NASA's Learning Technologies Project and the public at large can now be found on the Web. They are Lessons Learned from the LTP Conference in Maine, which can be found at **http://learn.ivv.nasa.gov/education/education.html** and Goddard's Cooperative Agreement Notice (CAN) at **http://developers.ivv.nasa.gov**.

> This bulletin will also be available in Adobe Acrobat format on the Developers' Workshop Web site at: **http://developers.ivv.nasa.gov/collab/pubs/bulletin/**

Nothin' but Net (cont.)

Resolution is the amount of information an image contains in the form of pixels. Therefore, the higher the resolution the larger the file size it will produce. How does one know what scan resolution to use? To determine this, keep in mind the final use of the scanned image and the resolution of the output device that will be used. Tailor the scanner's setting to reflect the output device's recommended resolution settings. Setting a resolution that is higher than that of the output device will not provide a higher quality image and could in fact make the image look worse.

There are a few simple adjustments that can be made to provide better scanned images. Crop excess white space before scanning or after the pre-scan using the marquee tool. This decreases the possibility of the scanner picking up unwanted image area or extra space. Make the scanned image sharper than it will be in the end product, since the image will be softened slightly during production. An image can also be sharpened with a retouching program such as Adobe's PhotoShop. Do any resizing, rotation, or resolution adjusting in the retouching stage, or simply rescan the image in the appropriate direction to achieve the desired size. It can be risky to try to scale or rotate an image in a page layout program since these types of programs are not necessarily designed to twist all of those pixels.

Along with producing useful, high-quality images, a scanner can be helpful in creating personal artwork as well. It is very difficult to draw anything by hand on a computer, so designers have come up with a neat trick. They scan in hand-drawn artwork, then use it as a template on which to implement the computer counterparts. This is an easy, quick way to create and manipulate designs without having to do all of the work on screen. It is also possible to experiment with scanning various objects that can be manipulated or combined in a collage using a retouching program.

Scanners are available in a variety of types and sizes, from paper-fed to flatbed, and there are scanning software programs to suit just about every need. It is important to know the basics of the scanning software and to learn to produce consistent, quality images every time. After that, the possibilities are limited only by the creator's imagination.

> If you would like to be on the LTP Bulletin mailing list, please send e-mail to Scott Gillespie at: sgillespie@rspac.ivv.nasa.gov, or write to: TRW/RSPAC, 100 University Drive, Fairmont, WV 26554. Phone: (304) 367-8324, fax: (304) 367-8211.

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